

SEQUENCE LISTING

COPY

<110> Lo, Kin-Ming
 Sun, Yaping
 Gillies, Stephen D.

<120> Expression and Export of Interferon-Alpha Proteins as
 Fc Fusion Proteins

<130> LEX-009

<140>

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<150> US 60/134,895

<151> 1999-05-19

<160> 29

<170> PatentIn Ver. 2.0

<210> 1

<211> 498

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(498)

<223> Human IFN alpha DNA sequence

<400> 1

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|---|----|
| tgt gat ctg cct cag acc cac agc ctg ggt aat agg agg gcc ttg ata | 48 |
| Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile | |
| 1 5 10 15 | |

| | |
|---|----|
| ctc ctg gca caa atg gga aga atc tct cct ttc tcc tgc ctg aag gac | 96 |
| Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp | |
| 20 25 30 | |

| | |
|---|-----|
| aga cat gac ttt gga ttc ccc cag gag gag ttt gat ggc aac cag ttc | 144 |
| Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe | |
| 35 40 45 | |

| | |
|---|-----|
| cag aag gct caa gcc atc cct gtc ctc cat gag atg atc cag cag acc | 192 |
| Gln Lys Ala Gln Ala Ile Pro Val Leu His Glu Met Ile Gln Gln Thr | |
| 50 55 60 | |

| | |
|---|-----|
| ttc aat ctc ttc agc aca aag gac tca tct gct act tgg gaa cag agc | 240 |
| Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Thr Trp Glu Gln Ser | |
| 65 70 75 80 | |

| | |
|---|-----|
| ctc cta gaa aaa ttt tcc act gaa ctt aac cag cag ctg aat gac ctg | 288 |
| Leu Leu Glu Lys Phe Ser Thr Glu Leu Asn Gln Gln Leu Asn Asp Leu | |
| 85 90 95 | |

| | |
|---|-----|
| gaa gcc tgc gtg ata cag gag gtt ggg gtg gaa gag act ccc ctg atg | 336 |
|---|-----|

Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met
 100 105 110
 aat gtg gac tcc atc ctg gct gtg aag aaa tac ttc caa aga atc act 384
 Asn Val Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Gln Arg Ile Thr
 115 120 125
 ctt tat ctg aca gag aag aaa tac agc cct tgt gcc tgg gag gtt gtc 432
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140
 aga gca gaa atc atg aga tcc ttc tct tta tca aaa att ttt caa gaa 480
 Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Lys Ile Phe Gln Glu
 145 150 155 160
 aga tta agg aag aag gat 498
 Arg Leu Arg Lys Lys Asp
 165

<210> 2
 <211> 166
 <212> PRT
 <213> Homo sapiens

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 Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
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 Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30
 Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45
 Gln Lys Ala Gln Ala Ile Pro Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60
 Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Thr Trp Glu Gln Ser
 65 70 75 80
 Leu Leu Glu Lys Phe Ser Thr Glu Leu Asn Gln Gln Leu Asn Asp Leu
 85 90 95
 Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met
 100 105 110
 Asn Val Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Gln Arg Ile Thr
 115 120 125
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140
 Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Lys Ile Phe Gln Glu
 145 150 155 160
 Arg Leu Arg Lys Lys Asp

<210> 3
 <211> 696
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> CDS
 <222> (1)..(696)
 <223> Human Fc DNA sequence

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<400> 3
gag ccc aaa tct tct gac aaa act cac aca tgc cca c      cca gca      48
Glu Pro Lys Ser Ser Asp Lys Thr His Thr Cys Pro P      Pro Ala
  1              5              10              15

cct gaa ctc ctg ggg gga ccg tca gtc ttc ctc ttc c      aaa ccc      96
Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe P      Lys Pro
              20              25

aag gac acc ctc atg atc tcc cgg acc cct gag gtc a      gtg gtg      144
Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val T      Val Val
              35              40

gtg gac gtg agc cac gaa gac cct gag gtc aag ttc a      tac gtg      192
Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe P      Tyr Val
              50              55              60

gac ggc gtg gag gtg cat aat gcc aag aca aag ccg c      gag cag      240
Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro P      Glu Gln
  65              70              75              80

tac aac agc acg tac cgt gtg gtc agc gtc ctc acc c      cac cag      288
Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr V      His Gln
              85              90              95

gac tgg ctg aat ggc aag gag tac aag tgc aag gtc t      aaa gcc      336
Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val S      Lys Ala
              100              105

ctc cca gcc ccc atc gag aaa acc atc tcc aaa gcc a      cag ccc      384
Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala P      Gln Pro
              115              120

cga gaa cca cag gtg tac acc ctg ccc cca tca cgg c      atg acc      432
Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg C      Met Thr
              130              135              140

aag aac cag gtc agc ctg acc tgc ctg gtc aaa ggc t      ccc agc      480
Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly P      Pro Ser
  145              150              155              160

gac atc gcc gtg gag tgg gag agc aat ggg cag ccg c      aac tac      528
Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro C      Asn Tyr
              165              170              175

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aag acc acg cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tat 576
 Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
 180 185 190

agc aag ctc acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc 624
 Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
 195 200 205

tca tgc tcc gtg atg cat gag gct ctg cac aac cac tac acg cag aag 672
 Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
 210 215 220

agc ctc tcc ctg tcc ccg ggt aaa 696
 Ser Leu Ser Leu Ser Pro Gly Lys
 225 230

<210> 4
 <211> 232
 <212> PRT
 <213> Homo sapiens

<400> 4
 Glu Pro Lys Ser Ser Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala
 1 5 10 15

Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
 20 25 30

Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
 35 40 45

Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val
 50 55 60

Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
 65 70 75 80

Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
 85 90 95

Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala
 100 105 110

Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
 115 120 125

Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr
 130 135 140

Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
 145 150 155 160

Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
 165 170 175

Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
180 185 190

Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe
195 200 205

Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
210 215 220

Ser Leu Ser Leu Ser Pro Gly Lys
225 230

<210> 5

<211> 27

<212> DNA

<213> Homo sapiens

<220>

<223> Forward PCR primer

<400> 5

cccggtataa tgtgatctgc ctcagac

27

<210> 6

<211> 26

<212> DNA

<213> Homo sapiens

<400> 6

ctcgagtcaa tccttcctcc ttaatc

26

<210> 7

<211> 162

<212> PRT

<213> Homo sapiens

<220>

<223> IFN alpha consensus sequence wherein, Xaa at any position besides positions 24,31,70 and 129 represents any amino acid.

<220>

<223> Xaa24 can be Ile or Leu, Xaa31 can be Lys or Gln, Xaa70 can be Thr or Ser and Xaa 129 can be Leu or Val.

<400> 7

Cys Asp Leu Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Leu Xaa
1 5 10 15

Xaa Xaa Xaa Xaa Met Xaa Xaa Xaa Ser Pro Xaa Xaa Cys Leu Xaa Xaa
20 25 30

Arg Xaa Asp Phe Xaa Xaa Pro Xaa Glu Xaa Xaa Xaa Xaa Gln Xaa

| | | |
|---|-----|-------------|
| 35 | 40 | 45 |
| Xaa Xaa Xaa Gln Ala Xaa Xaa Val Leu Xaa Xaa Xaa Xaa Gln Gln Xaa | | |
| 50 | 55 | 60 |
| Xaa Xaa Leu Phe Xaa Xaa Xaa Xaa Xaa Ser Ala Xaa Trp Xaa Xaa Thr | | |
| 65 | 70 | 75 80 |
| Leu Leu Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Gln Gln Leu Xaa Asp Leu | | |
| | 85 | 90 95 |
| Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa | | |
| | 100 | 105 110 |
| Xaa Val Xaa Xaa Xaa Leu Xaa Val Xaa Xaa Tyr Phe Xaa Xaa Ile Xaa | | |
| | 115 | 120 125 |
| Xaa Tyr Leu Xaa Xaa Lys Xaa Xaa Ser Xaa Cys Ala Trp Glu Xaa Xaa | | |
| | 130 | 135 140 |
| Xaa Xaa Xaa Xaa Met Arg Xaa Xaa Ser Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa | | |
| | 145 | 150 155 160 |

Arg Leu

<210> 8

<211> 166

<212> PRT

<213> Homo sapiens

<220>

<223> Human IFN alpha-1 protein

<400> 8

| |
|---|
| Cys Asp Leu Pro Glu Thr His Ser Leu Asp Asn Arg Arg Thr Leu Met |
| 1 5 10 15 |

| |
|---|
| Leu Leu Ala Gln Met Ser Arg Ile Ser Pro Ser Ser Cys Leu Met Asp |
| 20 25 30 |

| |
|---|
| Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe |
| 35 40 45 |

| |
|---|
| Gln Lys Ala Pro Ala Ile Ser Val Leu His Glu Leu Ile Gln Gln Ile |
| 50 55 60 |

| |
|---|
| Phe Asn Leu Phe Thr Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Asp |
| 65 70 75 80 |

| |
|---|
| Leu Leu Asp Lys Phe Cys Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu |
| 85 90 95 |

| |
|---|
| Glu Ala Cys Val Met Gln Glu Glu Arg Val Gly Glu Thr Pro Leu Met |
| 100 105 110 |

Asn Ala Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Arg Arg Ile Thr
 115 120 125
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140
 Arg Ala Glu Ile Met Arg Ser Leu Ser Leu Ser Thr Asn Leu Gln Glu
 145 150 155 160
 Arg Leu Arg Arg Lys Glu
 165

<210> 9

<211> 165

<212> PRT

<213> Homo sapiens

<220>

<223> Human IFN alpha-2 protein

<400> 9

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Ser Arg Arg Thr Leu Met
 1 5 10 15

Leu Leu Ala Gln Met Arg Lys Ile Ser Leu Phe Ser Cys Leu Lys Asp
 20 25 30

Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Gly Asn Gln Phe Gln
 35 40 45

Lys Ala Glu Thr Ile Pro Val Leu His Glu Met Ile Gln Gln Ile Phe
 50 55 60

Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Thr Leu
 65 70 75 80

Leu Asp Lys Phe Tyr Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu Glu
 85 90 95

Ala Cys Val Ile Gln Gly Val Gly Val Thr Glu Thr Pro Leu Met Lys
 100 105 110

Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr Leu
 115 120 125

Tyr Leu Lys Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val Arg
 130 135 140

Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Thr Asn Leu Gln Glu Ser
 145 150 155 160

Leu Arg Ser Lys Glu
 165

<210> 10

<211> 166
<212> PRT
<213> Homo sapiens

<220>
<223> Human IFN alpha-4 protein

<400> 10
Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
1 5 10 15
Leu Leu Ala Gln Met Gly Arg Ile Ser His Phe Ser Cys Leu Lys Asp
20 25 30
Arg His Asp Phe Gly Phe Pro Glu Glu Glu Phe Asp Gly His Gln Phe
35 40 45
Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
50 55 60
Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser
65 70 75 80
Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
85 90 95
Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met
100 105 110
Asn Val Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
115 120 125
Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
130 135 140
Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys
145 150 155 160
Arg Leu Arg Arg Lys Asp
165

<210> 11
<211> 166
<212> PRT
<213> Homo sapiens

<220>
<223> Human IFN alpha-5 protein

<400> 11
Cys Asp Leu Pro Gln Thr His Ser Leu Ser Asn Arg Arg Thr Leu Met
1 5 10 15
Ile Met Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
20 25 30

Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45

Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Thr Trp Asp Glu Thr
 65 70 75 80

Leu Leu Asp Lys Phe Tyr Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
 85 90 95

Glu Ala Cys Met Met Gln Glu Val Gly Val Glu Asp Thr Pro Leu Met
 100 105 110

Asn Val Asp Ser Ile Leu Thr Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140

Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Ala Asn Leu Gln Glu
 145 150 155 160

Arg Leu Arg Arg Lys Glu
 165

<210> 12

<211> 166

<212> PRT

<213> Homo sapiens

<220>

<223> HUMAN IFN alpha-6 protein

<400> 12

Cys Asp Leu Pro Gln Thr His Ser Leu Gly His Arg Arg Thr Met Met
 1 5 10 15

Leu Leu Ala Gln Met Arg Arg Ile Ser Leu Phe Ser Cys Leu Lys Asp
 20 25 30

Arg His Asp Phe Arg Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45

Gln Lys Ala Glu Ala Ile Ser Val Leu His Glu Val Ile Gln Gln Thr
 50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Val Ala Trp Asp Glu Arg
 65 70 75 80

Leu Leu Asp Lys Leu Tyr Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
 85 90 95

Glu Ala Cys Val Met Gln Glu Val Trp Val Gly Gly Thr Pro Leu Met
 100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140

Arg Ala Glu Ile Met Arg Ser Phe Ser Ser Ser Arg Asn Leu Gln Glu
 145 150 155 160

Arg Leu Arg Arg Lys Glu
 165

<210> 13

<211> 166

<212> PRT

<213> Homo sapiens

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<223> Human IFN alpha-7 protein

<400> 13

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 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30

Arg His Glu Phe Arg Phe Pro Glu Glu Glu Phe Asp Gly His Gln Phe
 35 40 45

Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser
 65 70 75 80

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
 85 90 95

Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met
 100 105 110

Asn Glu Asp Phe Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125

Leu Tyr Leu Met Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140

Arg Ala Glu Ile Met Arg Ser Phe Ser Phe Ser Thr Asn Leu Lys Lys
 145 150 155 160

Gly Leu Arg Arg Lys Asp
 165

<210> 14
 <211> 166
 <212> PRT
 <213> Homo sapiens

<220>
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<400> 14
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 1 5 10 15
 Leu Leu Ala Gln Met Arg Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30
 Arg His Asp Phe Glu Phe Pro Gln Glu Glu Phe Asp Asp Lys Gln Phe
 35 40 45
 Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60
 Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Leu Asp Glu Thr
 65 70 75 80
 Leu Leu Asp Glu Phe Tyr Ile Glu Leu Asp Gln Gln Leu Asn Asp Leu
 85 90 95
 Glu Val Leu Cys Asp Gln Glu Val Gly Val Ile Glu Ser Pro Leu Met
 100 105 110
 Tyr Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Ser Cys Ala Trp Glu Val Val
 130 135 140
 Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Ile Asn Leu Gln Lys
 145 150 155 160
 Arg Leu Lys Ser Lys Glu
 165

<210> 15
 <211> 166
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Human IFN alpha-10 protein

<400> 15
 Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
 1 5 10 15
 Leu Leu Gly Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30

Arg His Asp Phe Arg Ile Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45

Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser
 65 70 75 80

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
 85 90 95

Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met
 100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125

Leu Tyr Leu Ile Glu Arg Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys
 145 150 155 160

Arg Leu Arg Arg Lys Asp
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<210> 16

<211> 170

<212> PRT

<213> Homo sapiens

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<400> 16

Cys Ser Leu Gly Cys Asn Leu Ser Gln Thr His Ser Leu Asn Asn Arg
 1 5 10 15

Arg Thr Leu Met Leu Met Ala Gln Met Arg Arg Ile Ser Pro Phe Ser
 20 25 30

Cys Leu Lys Asp Arg His Asp Phe Glu Phe Pro Gln Glu Glu Phe Asp
 35 40 45

Gly Asn Gln Phe Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met
 50 55 60

Met Gln Gln Thr Phe Asn Leu Phe Ser Thr Lys Asn Ser Ser Ala Ala
 65 70 75 80

Trp Asp Glu Thr Leu Leu Glu Lys Phe Tyr Ile Glu Leu Phe Gln Gln
 85 90 95

Met Asn Asp Leu Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu

| | | |
|---|-----|-----|
| 100 | 105 | 110 |
| Thr Pro Leu Met Asn Glu Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe | | |
| 115 | 120 | 125 |
| Gln Arg Ile Thr Leu Tyr Leu Met Glu Lys Lys Tyr Ser Pro Cys Ala | | |
| 130 | 135 | 140 |
| Trp Glu Val Val Arg Ala Glu Ile Met Arg Ser Phe Ser Phe Ser Thr | | |
| 145 | 150 | 155 |
| | | 160 |
| Asn Leu Gln Lys Arg Leu Arg Arg Lys Asp | | |
| 165 | 170 | |

<210> 17
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 <212> PRT
 <213> Homo sapiens

<220>
 <223> Human IFN alpha-16 protein

<400> 17

| | | | |
|---|-----|-----|-----|
| Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile | | | |
| 1 | 5 | 10 | 15 |
| Leu Leu Ala Gln Met Gly Arg Ile Ser His Phe Ser Cys Leu Lys Asp | | | |
| 20 | 25 | 30 | |
| Arg Tyr Asp Phe Gly Phe Pro Gln Glu Val Phe Asp Gly Asn Gln Phe | | | |
| 35 | 40 | 45 | |
| Gln Lys Ala Gln Ala Ile Ser Ala Phe His Glu Met Ile Gln Gln Thr | | | |
| 50 | 55 | 60 | |
| Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Thr | | | |
| 65 | 70 | 75 | 80 |
| Leu Leu Asp Lys Phe Tyr Ile Glu Leu Phe Gln Gln Leu Asn Asp Leu | | | |
| 85 | 90 | 95 | |
| Glu Ala Cys Val Thr Gln Glu Val Gly Val Glu Glu Ile Ala Leu Met | | | |
| 100 | 105 | 110 | |
| Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr | | | |
| 115 | 120 | 125 | |
| Leu Tyr Leu Met Gly Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val | | | |
| 130 | 135 | 140 | |
| Arg Ala Glu Ile Met Arg Ser Phe Ser Phe Ser Thr Asn Leu Gln Lys | | | |
| 145 | 150 | 155 | 160 |
| Gly Leu Arg Arg Lys Asp | | | |
| 165 | | | |

<210> 18
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 <212> PRT
 <213> Homo sapiens

<220>
 <223> Human IFN alpha-17 protein

<400> 18
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 1 5 10 15
 Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30
 Arg His Asp Phe Gly Leu Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45
 Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60
 Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser
 65 70 75 80
 Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asn Leu
 85 90 95
 Glu Ala Cys Val Ile Gln Glu Val Gly Met Glu Glu Thr Pro Leu Met
 100 105 110
 Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140
 Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys
 145 150 155 160
 Ile Leu Arg Arg Lys Asp
 165

<210> 19
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 <212> PRT
 <213> Homo sapiens

<220>
 <223> Human IFN alpha-21 protein

<400> 19
 Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
 1 5 10 15
 Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp

| | | |
|---|-----|-----|
| 20 | 25 | 30 |
| Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe | | |
| 35 | 40 | 45 |
| Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr | | |
| 50 | 55 | 60 |
| Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Thr Trp Glu Gln Ser | | |
| 65 | 70 | 75 |
| Leu Leu Glu Lys Phe Ser Thr Glu Leu Asn Gln Gln Leu Asn Asp Leu | | |
| 85 | 90 | 95 |
| Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met | | |
| 100 | 105 | 110 |
| Asn Val Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Gln Arg Ile Thr | | |
| 115 | 120 | 125 |
| Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val | | |
| 130 | 135 | 140 |
| Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Lys Ile Phe Gln Glu | | |
| 145 | 150 | 155 |
| Arg Leu Arg Arg Lys Glu | | |
| 165 | | |

<210> 20

<211> 172

<212> PRT

<213> Homo sapiens

<220>

<223> Human IFN delta-1 protein

<400> 20

| |
|---|
| Cys Asp Leu Ser Gln Asn His Val Leu Val Gly Arg Lys Asn Leu Arg |
| 1 5 10 15 |

| |
|---|
| Leu Leu Asp Glu Met Arg Arg Leu Ser Pro His Phe Cys Leu Gln Asp |
| 20 25 30 |

| |
|---|
| Arg Lys Asp Phe Ala Leu Pro Gln Glu Met Val Glu Gly Gly Gln Leu |
| 35 40 45 |

| |
|---|
| Gln Glu Ala Gln Ala Ile Ser Val Leu His Glu Met Leu Gln Gln Ser |
| 50 55 60 |

| |
|---|
| Phe Asn Leu Phe His Thr Glu His Ser Ser Ala Ala Trp Asp Thr Thr |
| 65 70 75 80 |

| |
|---|
| Leu Leu Glu Pro Cys Arg Thr Gly Leu His Gln Gln Leu Asp Asn Leu |
| 85 90 95 |

Asp Ala Cys Leu Gly Gln Val Met Gly Glu Glu Asp Ser Ala Leu Gly
 100 105 110
 Arg Thr Gly Pro Thr Leu Ala Leu Lys Arg Tyr Phe Gln Gly Ile His
 115 120 125
 Val Tyr Leu Lys Glu Lys Gly Tyr Ser Asp Cys Ala Trp Glu Thr Val
 130 135 140
 Arg Leu Glu Ile Met Arg Ser Phe Ser Ser Leu Ile Ser Leu Gln Glu
 145 150 155 160
 Arg Leu Arg Met Met Asp Gly Asp Leu Ser Ser Pro
 165 170

<210> 21
 <211> 172
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Human IFN omega-1 protein

<400> 21
 Cys Asp Leu Pro Gln Asn His Gly Leu Leu Ser Arg Asn Thr Leu Val
 1 5 10 15
 Leu Leu His Gln Met Arg Arg Ile Ser Pro Phe Leu Cys Leu Lys Asp
 20 25 30
 Arg Arg Asp Phe Arg Phe Pro Gln Glu Met Val Lys Gly Ser Gln Leu
 35 40 45
 Gln Lys Ala His Val Met Ser Val Leu His Glu Met Leu Gln Gln Ile
 50 55 60
 Phe Ser Leu Phe His Thr Glu Arg Ser Ser Ala Ala Trp Asn Met Thr
 65 70 75 80
 Leu Leu Asp Gln Leu His Thr Gly Leu His Gln Gln Leu Gln His Leu
 85 90 95
 Glu Thr Cys Leu Leu Gln Val Val Gly Glu Gly Glu Ser Ala Gly Ala
 100 105 110
 Ile Ser Ser Pro Ala Leu Thr Leu Arg Arg Tyr Phe Gln Gly Ile Arg
 115 120 125
 Val Tyr Leu Lys Glu Lys Lys Tyr Ser Asp Cys Ala Trp Glu Val Val
 130 135 140
 Arg Met Glu Ile Met Lys Ser Leu Phe Leu Ser Thr Asn Met Gln Glu
 145 150 155 160
 Arg Leu Arg Ser Lys Asp Arg Asp Leu Gly Ser Ser
 165 170

<210> 22
 <211> 166
 <212> PRT
 <213> Mus musculus

<220>
 <223> Mouse IFN alpha-1 protein

<400> 22
 Cys Asp Leu Pro Gln Thr His Asn Leu Arg Asn Lys Arg Ala Leu Thr
 1 5 10 15
 Leu Leu Val Gln Met Arg Arg Leu Ser Pro Leu Ser Cys Leu Lys Asp
 20 25 30
 Arg Lys Asp Phe Gly Phe Pro Gln Glu Lys Val Asp Ala Gln Gln Ile
 35 40 45
 Lys Lys Ala Gln Ala Ile Pro Val Leu Ser Glu Leu Thr Gln Gln Ile
 50 55 60
 Leu Asn Ile Phe Thr Ser Lys Asp Ser Ser Ala Ala Trp Asn Ala Thr
 65 70 75 80
 Leu Leu Asp Ser Phe Cys Asn Asp Leu His Gln Gln Leu Asn Asp Leu
 85 90 95
 Gln Gly Cys Leu Met Gln Gln Val Gly Val Gln Glu Phe Pro Leu Thr
 100 105 110
 Gln Glu Asp Ala Leu Leu Ala Val Arg Lys Tyr Phe His Arg Ile Thr
 115 120 125
 Val Tyr Leu Arg Glu Lys Lys His Ser Pro Cys Ala Trp Glu Val Val
 130 135 140
 Arg Ala Glu Val Trp Arg Ala Leu Ser Ser Ser Ala Asn Val Leu Gly
 145 150 155 160
 Arg Leu Arg Glu Glu Lys
 165

<210> 23
 <211> 167
 <212> PRT
 <213> Mus musculus

<220>
 <223> Mouse IFN alpha-2 protein

<400> 23
 Cys Asp Leu Pro His Thr Tyr Asn Leu Arg Asn Lys Arg Ala Leu Lys
 1 5 10 15

Val Leu Ala Gln Met Arg Arg Leu Pro Phe Leu Ser Cys Leu Lys Asp
 20 25 30
 Arg Gln Asp Phe Gly Phe Pro Leu Glu Lys Val Asp Asn Gln Gln Ile
 35 40 45
 Gln Lys Ala Gln Ala Ile Pro Val Leu Arg Asp Leu Thr Gln Gln Thr
 50 55 60
 Leu Asn Leu Phe Thr Ser Lys Ala Ser Ser Ala Ala Trp Asn Ala Thr
 65 70 75 80
 Leu Leu Asp Ser Phe Cys Asn Asp Leu His Gln Gln Leu Asn Asp Leu
 85 90 95
 Gln Thr Cys Leu Met Gln Gln Val Gly Val Gln Glu Pro Pro Leu Thr
 100 105 110
 Gln Glu Asp Ala Leu Leu Ala Val Arg Lys Tyr Phe His Arg Ile Thr
 115 120 125
 Val Tyr Leu Arg Glu Lys Lys His Ser Pro Cys Ala Trp Glu Val Val
 130 135 140
 Arg Ala Glu Val Trp Arg Ala Leu Ser Ser Ser Val Asn Leu Leu Pro
 145 150 155 160
 Arg Leu Ser Glu Glu Lys Glu
 165

<210> 24

<211> 162

<212> PRT

<213> Mus musculus

<220>

<223> Mouse IFN alpha-4 protein

<400> 24

Cys Asp Leu Pro His Thr Tyr Asn Leu Gly Asn Lys Arg Ala Leu Thr
 1 5 10 15

Val Leu Glu Glu Met Arg Arg Leu Pro Pro Leu Ser Cys Leu Lys Asp
 20 25 30

Arg Lys Asp Phe Gly Phe Pro Leu Glu Lys Val Asp Asn Gln Gln Ile
 35 40 45

Gln Lys Ala Gln Ala Ile Leu Val Leu Arg Asp Leu Thr Gln Gln Ile
 50 55 60

Leu Asn Leu Phe Thr Ser Lys Asp Leu Ser Ala Thr Trp Asn Ala Thr
 65 70 75 80

Leu Leu Asp Ser Phe Cys Asn Asp Leu His Gln Gln Leu Asn Asp Leu
 85 90 95

Lys Ala Cys Val Met Gln Glu Pro Pro Leu Thr Gln Glu Asp Ser Leu
100 105 110

Leu Ala Val Arg Thr Tyr Phe His Arg Ile Thr Val Tyr Leu Arg Lys
115 120 125

Lys Lys His Ser Leu Cys Ala Trp Glu Val Ile Arg Ala Glu Val Trp
130 135 140

Arg Ala Leu Ser Ser Ser Thr Asn Leu Leu Ala Arg Leu Ser Glu Glu
145 150 155 160

Lys Glu

<210> 25

<211> 166

<212> PRT

<213> Mus musculus

<220>

<223> Mouse IFN alpha-5 protein

<400> 25

Cys Asp Leu Leu Gln Thr His Asn Leu Arg Asn Lys Arg Ala Leu Thr
1 5 10 15

Leu Leu Val Lys Met Arg Arg Leu Ser Pro Leu Ser Cys Leu Lys Asp
20 25 30

Arg Lys Asp Phe Gly Phe Pro Gln Glu Lys Val Gly Ala Gln Gln Ile
35 40 45

Gln Glu Ala Gln Ala Ile Pro Val Leu Ser Glu Leu Thr Gln Gln Val
50 55 60

Leu Asn Ile Phe Thr Ser Lys Asp Ser Ser Ala Ala Trp Asn Ala Thr
65 70 75 80

Leu Leu Asp Ser Phe Cys Asn Glu Val His Gln Gln Leu Asn Asp Leu
85 90 95

Lys Ala Cys Val Met Gln Gln Val Gly Val Gln Glu Ser Pro Leu Thr
100 105 110

Gln Glu Asp Ser Leu Leu Ala Val Arg Lys Tyr Phe His Arg Ile Thr
115 120 125

Val Tyr Leu Arg Glu Lys Lys His Ser Pro Cys Ala Trp Glu Val Val
130 135 140

Arg Ala Glu Val Trp Arg Ala Leu Ser Ser Ser Val Asn Leu Leu Ala
145 150 155 160

Arg Leu Ser Lys Glu Glu

165

<210> 26
<211> 166
<212> PRT
<213> Mus musculus

<220>
<223> Mouse IFN alpha-6 protein

<400> 26
Cys Asp Leu Pro Gln Thr His Asn Leu Arg Asn Lys Arg Ala Leu Thr
1 5 10 15
Leu Leu Val Lys Met Arg Arg Leu Ser Pro Leu Ser Cys Leu Lys Asp
20 25 30
Arg Lys Asp Phe Gly Phe Pro Gln Glu Lys Val Gly Ala Gln Gln Ile
35 40 45
Gln Glu Ala Gln Ala Ile Pro Val Leu Thr Glu Leu Thr Gln Gln Ile
50 55 60
Leu Thr Leu Phe Thr Ser Lys Asp Ser Ser Ala Ala Trp Asn Ala Thr
65 70 75 80
Leu Leu Asp Ser Phe Cys Asn Asp Leu His Gln Leu Leu Asn Asp Leu
85 90 95
Gln Gly Cys Leu Met Gln Gln Val Glu Ile Gln Ala Leu Pro Leu Thr
100 105 110
Gln Glu Asp Ser Leu Leu Ala Val Arg Thr Tyr Phe His Arg Ile Thr
115 120 125
Val Phe Leu Arg Glu Lys Lys His Ser Pro Cys Ala Trp Glu Val Val
130 135 140
Arg Ala Glu Val Trp Arg Ala Leu Ser Ser Ser Ala Lys Leu Leu Ala
145 150 155 160
Arg Leu Asn Glu Asp Glu
165

<210> 27
<211> 167
<212> PRT
<213> Mus musculus

<220>
<223> Mouse IFN alpha-7 protein

<400> 27
Cys Asp Leu Pro Gln Thr His Asn Leu Arg Asn Lys Arg Ala Leu Thr
1 5 10 15

Leu Leu Val Lys Met Arg Arg Leu Ser Pro Leu Ser Cys Leu Lys Asp
20 25 30

Arg Lys Asp Phe Gly Phe Pro Gln Ala Lys Val Asp Ala Gln Gln Ile
35 40 45

Gln Glu Ala Gln Ala Ile Pro Val Leu Ser Glu Leu Thr Gln Gln Ile
50 55 60

Leu Asn Ile Phe Thr Ser Lys Asp Ser Ser Ala Ala Trp Asn Ala Thr
65 70 75 80

Leu Leu Asp Ser Val Cys Asn Asp Leu His Gln Gln Leu Asn Asp Leu
85 90 95

Gln Gly Cys Leu Met Gln Glu Val Gly Val Gln Glu Leu Ser Leu Thr
100 105 110

Gln Glu Asp Ser Leu Leu Ala Val Arg Lys Tyr Phe His Arg Ile Thr
115 120 125

Val Phe Leu Arg Glu Lys Lys His Ser Pro Cys Ala Trp Glu Val Val
130 135 140

Arg Ala Glu Ile Trp Arg Ala Leu Ser Ser Ser Ala Asn Leu Leu Ala
145 150 155 160

Arg Leu Ser Glu Lys Lys Glu
165

<210> 28

<211> 166

<212> PRT

<213> Mus musculus

<220>

<223> Mouse IFN alpha-8 protein

<400> 28

Cys Asp Leu Pro Gln Thr His Asn Leu Arg Asn Lys Arg Ala Leu Thr
1 5 10 15

Leu Leu Val Lys Met Arg Arg Leu Ser Pro Leu Ser Cys Leu Lys Asp
20 25 30

Arg Lys Asp Phe Gly Phe Pro Gln Glu Lys Val Gly Ala Gln Gln Ile
35 40 45

Gln Glu Ala Gln Ala Ile Pro Val Leu Thr Glu Leu Thr Gln Gln Ile
50 55 60

Leu Ala Leu Phe Thr Ser Lys Asp Ser Ser Ala Ala Trp Asn Ala Thr
65 70 75 80

Leu Leu Asp Ser Phe Cys Asn Asp Leu His Gln Leu Leu Asn Asp Leu

Arg Leu Ser Glu Glu Lys Glu
165

165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000